**Before the**
**FEDERAL COMMUNICATIONS COMMISSION**
**Washington, D.C. 20554**

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| **In the Matter of** | **)** | |
| | **)** | |
| **Amendment of the Amateur Service Rules to** | **)** | **WT Docket No. 10-62** |
| **Facilitate Use of Spread Spectrum** | **)** | |
| **Communications Technologies** | **)** | |

**To: The Commission**
**Via: Office of the Secretary**

## COMMENTS OF ARRL, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel, hereby respectfully submits its comments in response to the *Notice of Proposed Rule Making and Order*, FCC 10-38, 25 FCC Rcd. 3374, 75 Fed. Reg. 27272, released March 16, 2010 (the Notice).[1] The Notice was issued pursuant to ARRL's Petition for Rule Making, RM-11325, filed March 13, 2006 (the ARRL Petition). The ARRL Petition proposed the deletion of Section 97.311(d) of the Commission's rules, save for the first sentence thereof. The effect of this would be to eliminate an automatic power control provision for Amateur Radio Spread Spectrum (SS) communications. The Notice proposes that relief, but at the same time, as something of a tradeoff, proposes to reduce the maximum transmitter power output when an Amateur station is transmitting an SS emission, from a maximum of 100 watts to a maximum of 10 watts PEP transmitter output power. For its comments in response to the Notice proposals, ARRL states as follows:

[1] ARRL makes no comment herein on the Order portion of FCC 10-38. Those rule changes implemented in the Order are editorial in nature and are appropriate, timely corrections to the Amateur Service rules.

1. The proposed deletion of the Automatic Power Control (APC) requirement for Amateur SS communications is timely and necessary. ARRL's Petition showed that the APC requirement has, since it was first imposed in 1997, been impractical of compliance; unnecessary in order to protect other Amateur Radio operations or the operation of any licensed radio service sharing certain Amateur Radio allocations; and it has served as an unintended, but effective deterrent to Spread Spectrum experimentation in the Amateur Service. When SS communications in the Amateur Service were first authorized by the Commission in 1985 [2] in order to permit Amateurs to develop, test and operate low cost SS systems and thus to stimulate advances in radio technology, consistent with the basis and purpose of the Amateur Service, there were specific benefits to the public enumerated by the Commission. These included the following: (1) reduced power density and concomitant reduction of interference to narrow band communication systems; (2) realizable improvements in communications under conditions with poor signal-to-interference ratios; (3) improved communication performance in selective fading and multipath environments; and (4) the ability to accommodate more communication channels functioning simultaneously in the same spectrum than is possible using frequency division multiple access exclusively. These purposes are not served by rules that discourage such experimentation.

2. The Commission has revisited the rules governing Amateur SS communications several times. At no time, however, since the first SS operation has been authorized by the Commission, to ARRL's knowledge, has anyone provided

[2] *Report and Order*, 99 FCC 2d 1432; 58 RR 2d 328 (1985) in Gen. Docket 81-414. However, as early as 1981, Amateur SS experiments were authorized by Special Temporary Authority granted by the Commission to members of the Amateur Radio Research and Development Corporation (AMRAD) in 1981. See, *FCC Encourages Amateur Radio Experimentation*, FCC *News Release*, March 9, 1981.

documentation of harmful interference from Amateur SS communications to narrowband Amateur operation, nor to any authorized radio service operating in the same spectrum. Neither, as far as ARRL is aware, has there ever been an allegation of actual interference to any Part 15 device or system operating at 902-928 MHz or 2400-2450 MHz from an Amateur SS system. In December of 1995, ARRL filed a Petition for Rule Making [3] proposing several modifications to the Commission's rules, seeking in general to eliminate restrictions which inhibited Amateur SS experimentation. In that Petition, ARRL noted that there had not, in the intervening ten years since the first authorization of SS in the Amateur Service, been reported to ARRL a single instance of interference from Amateur SS operation to either other Amateur stations or stations in other services which share certain Amateur allocations where SS is permitted. That same situation exists today. Inter-service and intra-service interference fears that resulted in certain regulatory restrictions applied to SS in 1985 have not proven to be an issue at all.

3. Among the changes to the SS rules proposed in 1995 by ARRL was a suggestion to incorporate APC for SS communications. Previously, the SS rules [then Section 97.311(g)] simply limited stations using SS emissions to 100 watts. It was believed at the time that APC would be a technical implementation of the fundamental, overarching requirement in the Amateur Rules that at all times an Amateur station must use the minimum transmitter power necessary to carry out the desired communication.[4] ARRL believed at the time that APC for SS could be accomplished technically. It was not, however, ever suggested by ARRL or the Commission that APC was necessary to avoid interference. Quite the contrary; the Commission concluded that SS

[3] RM-8737
[4] 47 C.F.R.§ 97.313(a)

communications were entirely compatible with other operations on the same frequencies. In its March 3, 1997 *Notice of Proposed Rule Making*, FCC 97-10, in WT Docket 97-12, the Commission stated therein, in part, that:

> We believe that the amendments requested would increase spectrum efficiency and allow amateur operators to contribute to technological advances in communication systems and equipment. Experiments conducted by amateur operators have shown that stations transmitting SS emissions can co-exist with other amateur stations, and in many cases these spread spectrum emissions are undetectable by other amateur stations….
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> *Id. at ¶ 8.*

4. ARRL is gratified that the Commission's conclusions in the instant Notice are not inconsistent with that earlier finding. The Notice, at paragraph 5, states that

> In order to experiment, the Commission's rules require knowledge that the control operator does not ordinarily have, *i.e.*, the transmitter power received at a distant receiver or receivers. Consequently, amateur radio operators currently may not be experimenting with SS communications to the greatest possible extent. We also note that notwithstanding the APC requirement, amateur station power output is limited to the minimum power necessary to carry out the desired communication (footnote omitted). For these reasons, we agree with ARRL that the APC requirement may be unnecessarily impeding amateur radio operators in advancing the radio art.

It is apparent, as earlier predicted by some SS experimenters that the APC requirement is difficult to implement and serves as a substantial disincentive to experiment in the Amateur Service. Further, elimination of the requirement does not change the regulatory obligations of Amateur licensees using SS whatsoever. The absolute obligation of an Amateur station transmitting SS emissions to utilize the minimum power necessary to conduct communications is intact, according to Section 97.313(a) of the Commission's

Rules.[5] Furthermore, the SS rules already make SS essentially secondary to any Amateur narrowband emission modes.[6] Given these existing rules, the APC requirement is not necessary to avoid interference to any other user of the same spectrum as the Amateur SS emission. The only change would be that Amateur SS equipment would not have to be configured to calculate the lowest transmitter power necessary by reference to a remote receiver or to multiple receivers, which has proven an impossible task in many applications. The minimum transmitter power can be determined more flexibly and practically by the Amateur station transmitting the SS emissions, using whatever techniques are necessary to comply with the minimum power rule. This removes a substantial obstacle to SS experimentation, which is clearly the Commission's goal.

5. More difficult conceptually is the proposed, and seemingly arbitrary, power limit reduction from 100 watts PEP transmitter power output to only 10 watts PEP output power. The Commission, citing the unquantified and subjective comments of three individual commenters in this proceeding[7] proposes a reduction of the maximum permitted power of 90 percent. In its Petition, ARRL stated that it did not object to the continuation of the 100 watt power limitation, because there was no evidence that that limit contributes to the current regulatory disincentive to experiment with SS (and

[5] "At all times, an amateur station must use the minimum transmitter power necessary to carry out the desired communications."

[6] See, Section 97.311(b): "A station transmitting SS emissions must not cause harmful interference to stations employing other authorized emissions, and must accept all interference caused by stations employing other authorized emissions."

[7] These three comments had no factual underpinnings, but were simply expositions of personal opinion. They did not in any case establish a factual basis for the 90 percent maximum power reduction proposed by the Commission. The comment of Mr. Steve Sampson cited at footnote 16 of the Notice simply said that "very few" Amateurs operated at more than 10 watts in the 70 cm band. Mr. Michael Dobson stated that 10 watts is "still a very significant power level" and quite effective for communications at the frequencies where SS signals would routinely be used. The comment of Mr. Timothy Gorman said that at 70 cm and above, operation over a 10 to 20 km path is possible with power levels between 200 mW and 10 W, depending on antenna gain. None of these comments established that ten watts is in any sense necessary or sufficient to avoid interaction between narrowband and SS emissions in the same spectrum.

because it limits the power spectral density of an SS emission in the Amateur Service, thus contributing to the apparent compatibility between Amateur SS and Amateur narrowband modes in the same allocations). But there is no justification for the power *decrease* to be found in the Notice, and no showing in the record thus far that the reduction proposed in the Notice is necessary to avoid intra- or inter-service interference. ARRL notes that there are no documented cases of actual interference from SS operations to narrowband Amateur or non-Amateur operations, either before or after the APC requirement was enacted.[8] The 100-watt limit was put into effect in 1985, ten years before any APC requirement was implemented. Additionally, the rules presently require use of the minimum power necessary to conduct the communications ongoing, and therefore, if power less than 100 watts is sufficient, that lower power will be used. Finally, the rules include a non-interference requirement for Amateur SS communications and make such operations effectively secondary to other Amateur communications, which provides an added incentive to licensees experimenting with SS to avoid interference and utilize low power where possible.

6. For these reasons, the Commission should avoid the imposition of an effectively arbitrary power limit while eliminating the APC requirement; such is arguably substituting one disincentive to SS experimentation with a different one. Such would be antithetical to the goal enunciated by the Commission in the Notice, which is to "encourage individuals who can contribute to the advancement of the radio art to more fully utilize SS technologies in experimentation." [9] Nor is a power reduction necessarily

[8] ARRL acknowledges that the absence of actual interference complaints here is of limited value in determining the proper SS power output maximum, inasmuch as there has not been extensive deployment of SS emissions in the Amateur Service during the past 25 years, due in part to regulatory constraints.
[9] See, the Notice, at ¶ 7.

the "balance" of interests of users in mixed-mode and mixed-service frequency bands "until sharing protocols are sufficiently developed to avoid interference" as the Commission describes the power restriction.[10] No balancing has been shown in 25 years of SS operation to be necessary.

7. That said, ARRL is not at present prepared to argue that a power limit of ten watts PEP output is a substantial handicap to SS experimentation. While the proposed 90 percent decrease in maximum power output is not viewed as necessary, ARRL is willing to accept the restriction presently, subject to revisiting the matter after some reasonable experience is gained with it. The Amateur Service can, in the meantime, ascertain (1) whether or not the reduced power limit is or is not a substantial disincentive to expanded SS experimentation, and (2) whether or not increased power can be implemented without a risk of additional interference to other Amateur stations and other radio services in the bands in which SS is and will be deployed.

Therefore, the foregoing considered, ARRL respectfully requests that the Commission proceed with the Notice proposals: (a) to delete the APC requirement of Section 97.311(d) of the Commission's rules; (b) to move the power limit for SS communications from Section 97.311 to 97.313(j) of the rules; and (3) if the record developed in comments in response to the Notice supports the proposed power reduction from 100 watts PEP output power to 10 watts, as proposed, then to implement that power

[10] *Id.*

reduction, subject to revisiting the matter at a later date if the reduction proves a substantial disincentive to expanded SS experimentation in the Amateur Service.

Respectfully submitted,

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